KOLAR Document ID: 1451833

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form U3C
June 2015
Form must be Typed
Form must be completed on a per well basis

ANNUAL REPORT OF PRESSURE MONITORING, FLUID INJECTION AND ENHANCED RECOVERY

Complete all blanks - add pages if needed. Copy to be retained for five (5) years after filing date.

OPERATOR: License # 33999
Name: Riviera Operating, LLC
Address 1: 600 TRAVIS STE 1700
Address 2:
City: HOUSTON State: TX Zip: 77002 + 3009
Contact Person: Michael Foster
Phone: (281) 840-4375
Lease Name: FINLEY
Well Number: 1

API No.: 15-055-21240-00-01
Permit No: D26881.0
Reporting Year: 2018
(January 1 to December 31)

(Q/Q/Q/Q) NW - SW - NE Sec. 4 Twp. 24 S. R. 32 ☐ E ☑ W
3292 feet from ☐ N / ☑ S Line of Section
1974 feet from ☑ E / ☐ W Line of Section
County: Finney

I. Injection Fluid:

Type *(Pick one)*: ☐ Fresh Water ☐ Treated Brine ☑ Untreated Brine ☐ Water/Brine
Source: ☑ Produced Water ☐ Other *(Attach list)*
Quality: Total Dissolved Solids: _____ mg/l Specific Gravity: _____ Additives: _____
(Attach water analysis, if available)

II. Well Data:

Maximum Authorized Injection Pressure: 300 psi Injection Zone: LANSING
Maximum Authorized Injection Rate: 5000 barrels per day
Total Number of Enhanced Recovery Injection Wells Covered by this Permit: _____ *(Include TA's)*

III.

Month:	Total Fluid Injected BBL	Maximum Fluid Pressure	Total Gas Injected MCF	Maximum Gas Pressure	# Days of Injection
January	11894				31
February	10958				28
March	14303				31
April	13765				30
May	13444				31
June	10031				30
July	12075				31
August	8728				31
September	8355				30
October	8144				31
November	1978				30
December	391				31
TOTAL	114066		0		

Submitted Electronically

JACAM LABORATORIES

DownHole R_x

WATER CHEMISTRY

LINN OPERATING
JEFF SULLIVAN
FINNEY KS

FINLEY SWDW 1
DUMP VALVE

Report Date: 01-02-2019
Sample #: 3076

Sampled: 12-17-2018
at 0000

Sample ID: 208790

CATIONS		ANIONS	
Calcium (as Ca)	7286	Chloride (as Cl)	91600
Magnesium (as Mg)	2272	Sulfate (as SO_4)	850.00
Barium (as Ba)	0.195	Bromine (as Br)	0.00
Strontium (as Sr)	166.40	Dissolved CO_2 (as CO_2)	199.50
Sodium (as Na)	42456	Bicarbonate (as HCO_3)	42.70
Potassium (as K)	500.80	Carbonate (as CO_3)	0.00
Lithium (as Li)	6.47	Oxalic acid (as C_2O_4)	0.00
Ammonia (as NH_3)	0.00	Silica (as SiO_2)	0.00
Aluminum (as Al)	0.00	Phosphate(as PO_4)	0.00
Iron (as Fe)	99.59	H_2S (as H_2S)	5.00
Manganese (as Mn)	1.20	Fluoride (as F)	0.00
Zinc (as Zn)	0.403	Nitrate (as NO_3)	0.00
Lead (as Pb)	0.00	Boron (as B)	23.58

PARAMETERS

Calculated T.D.S.	141949
Molar Conductivity	211191
Resistivity	4.74
Sp.Gr.(g/mL)	1.10
Pressure(atm)	1.00
pCO_2(atm)	0.00270
pH_2S(atm)	0.00335
Temperature (^oF)	61.60
pH	6.99

COMMENTS

FINNEY KS

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

JACAM LABORATORIES

DownHole R_x

DEPOSITION POTENTIAL INDICATORS

LINN OPERATING
JEFF SULLIVAN
FINNEY KS

FINLEY SWDW 1
DUMP VALVE

Report Date: 01-02-2019 Sampled: 12-17-2018
Sample #: 3076 at 0000

Sample ID: 208790

SATURATION LEVEL	
Calcite ($CaCO_3$)	0.583
Aragonite ($CaCO_3$)	0.514
Witherite ($BaCO_3$)	< 0.001
Strontianite ($SrCO_3$)	0.0209
Calcium oxalate (CaC_2O_4)	0.00
Magnesite ($MgCO_3$)	0.171
Anhydrite ($CaSO_4$)	0.400
Gypsum ($CaSO_4*2H_2O$)	0.593
Barite ($BaSO_4$)	0.650
Celestite ($SrSO_4$)	0.294
Fluorite (CaF_2)	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO_2)	0.00
Brucite ($Mg(OH)_2$)	< 0.001
Magnesium silicate	0.00
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	0.00
Siderite ($FeCO_3$)	5.40
Halite (NaCl)	0.0686
Thenardite ($Na2SO_4$)	< 0.001
Iron sulfide (FeS)	60.18

MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite ($CaCO_3$)	-0.00720
Aragonite ($CaCO_3$)	-0.00953
Witherite ($BaCO_3$)	-25.09
Strontianite ($SrCO_3$)	-0.690
Calcium oxalate (CaC_2O_4)	-0.00751
Magnesite ($MgCO_3$)	-0.0411
Anhydrite ($CaSO_4$)	-182.66
Gypsum ($CaSO_4*2H_2O$)	-95.81
Barite ($BaSO_4$)	-0.0621
Celestite ($SrSO_4$)	-120.28
Fluorite (CaF_2)	-2.77
Calcium phosphate	>-0.001
Hydroxyapatite	-297.39
Silica (SiO_2)	-26.99
Brucite ($Mg(OH)_2$)	0.00160
Magnesium silicate	-90.64
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	>-0.001
Siderite ($FeCO_3$)	0.00949
Halite (NaCl)	-121351
Thenardite ($Na2SO_4$)	-83322
Iron sulfide (FeS)	0.860

SIMPLE INDICES	
Langelier	0.278
Ryznar	6.43
Puckorius	6.84
Larson-Skold Index	4768
Stiff Davis Index	-0.225
Oddo-Tomson	-0.877

BOUND IONS	TOTAL	FREE
Calcium	7286	7149
Barium	0.195	0.195
Carbonate	1.01	0.0173
Phosphate	0.00	0.00
Sulfate	850.00	255.29

OPERATING CONDITIONS

Temperature (^oF)	61.60
Time(secs)	0.00

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

DownHole SAT™ Water Analysis Report

JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
FINLEY SWDW 1
JEFF SULLIVAN
DUMP VALVE
FINNEY KS

Sample ID#: 3076
ID: 208790
Report Date: 01-02-2019
Sample Date: 12-17-2018
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	7286
Magnesium(as Mg)	2272
Barium(as Ba)	0.195
Strontium(as Sr)	166.40
Sodium(as Na)	42456
Potassium(as K)	500.80
Lithium(as Li)	6.47
Iron(as Fe)	99.59
Field Iron(as Fe)	300.00
Ammonia(as NH_3)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	1.20
Zinc(as Zn)	0.403
Lead(as Pb)	0.00
Sample pH	6.99
Conductivity:	211191

ANIONS

Chloride(as Cl)	91600
Sulfate(as SO_4)	850.00
Bromine(as Br)	0.00
Dissolved CO_2(as CO_2)	199.50
Bicarbonate(as HCO_3)	42.70
Carbonate(as CO_3)	0.00
Silica(as SiO_2)	0.00
Phosphate(as PO_4)	0.00
H_2S (as H_2S)	5.00
Fluoride(as F)	0.00
Nitrate(as NO_3)	0.00
Boron(as B)	23.58

PARAMETERS

Temperature(°F)	61.60
T.D.S.	141949
Resistivity:	4.74

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawenite FeS		CO_2 (mpy)	pCO_2 (atm)
50.00	0.00	0.462	-0.0102	0.433	-167.73	0.656	-76.96	0.950	-0.00605	0.328	-108.98	3.92	0.00756	308.64	4.32	0.0135	0.00270
65.45	0.00	0.626	-0.00626	0.392	-185.41	0.574	-101.49	0.578	-0.0843	0.287	-122.83	5.96	0.0101	254.76	3.73	0.0252	0.00270
80.91	0.00	0.809	-0.00287	0.376	-186.25	0.514	-121.38	0.374	-0.193	0.267	-128.73	8.58	0.0124	209.87	3.22	0.00875	0.00270
96.36	0.00	0.994	>-0.001	0.379	-173.10	0.468	-136.76	0.255	-0.336	0.256	-130.17	11.67	0.0143	173.27	2.80	0.0115	0.00270
111.82	0.00	1.16	0.00204	0.399	-149.96	0.466	-129.95	0.182	-0.516	0.250	-129.70	15.05	0.0156	143.79	2.46	0.0120	0.00270
127.27	0.00	1.31	0.00362	0.439	-121.08	0.491	-111.27	0.132	-0.754	0.243	-129.76	18.59	0.0165	120.37	2.19	0.0101	0.00270
142.73	0.00	1.43	0.00460	0.500	-90.23	0.514	-96.77	0.0969	-1.07	0.235	-130.53	21.96	0.0170	101.43	1.97	0.00816	0.00270
158.18	0.00	1.49	0.00495	0.589	-60.29	0.533	-85.50	0.0718	-1.48	0.227	-131.94	24.70	0.0168	85.81	1.79	0.00850	0.00270
173.64	0.00	1.48	0.00468	0.714	-33.19	0.549	-76.78	0.0536	-2.01	0.218	-133.98	26.39	0.0160	72.68	1.65	0.00880	0.00270
189.09	0.00	1.42	0.00391	0.890	-9.88	0.563	-70.06	0.0405	-2.68	0.209	-136.62	26.84	0.0148	61.46	1.52	0.00444	0.00270
204.55	0.00	1.31	0.00278	1.14	9.36	0.574	-64.97	0.0308	-3.54	0.200	-139.88	26.01	0.0132	51.73	1.42	0.00372	0.00270
220.00	0.171	1.14	0.00126	1.47	24.85	0.576	-64.13	0.0234	-4.65	0.190	-146.80	23.66	0.0116	48.67	1.55	0.00506	0.00316
		xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.